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TECHNICAL NOTES

LAKE STATES FOREST EXPERIMENT STATION U.S. DEPARTMENT OF AGRICULTURE · · FOREST SERVICE

No. 563

Sawtimber Log Grades in Wisconsin

Log grades are a measure of sawtimber quality and value. The grade distribution of the sawtimber resource in an area indicates the type of industry it can support now and in the near future.

A special study made in 1953 provided log grade data for northwestern, northeastern, and central Wisconsin. Information for southern Wisconsin was taken during the regular forest survey in 1956 and 1957. These data are the result of a cooperative effort by the Lake States Forest Experiment Station, the Wisconsin Conservation Department, and others participating in the Wisconsin Forest Inventory. The sample consisted of 1,112 trees. This was sufficient to provide usable proportions of volume by log grade for 10 major species (table 1).

Table 1.--Percent of merchantable volume in each log grade,
by major species, Wisconsin

Species	: Volume :	Percent by log grades ^{1/}			
	: in sample, :	No. 1	No. 2	No. 3	Tie &
	: bd. ft. :	:	:	:	timber
<u>Conifers</u>					
White pine	6,300	36	33	31	-
Red pine	4,300	20	26	54	-
<u>Hardwoods</u>					
Sugar maple	22,900	22	21	36	21
Basswood	17,400	19	23	36	22
American elm	10,500	24	30	27	19
Slippery elm	7,200	18	38	30	14
Red oak	43,800	10	20	35	35
Black oak	4,600	7	11	12	70
White oak	11,800	5	11	40	44
Ash	6,800	7	35	41	17

^{1/} For specifications see: Hardwoods--Hardwood Log Grades for Standard Lumber, U. S. Forest Prod. Lab. Rpt. D-1737, 60 pp., Madison, Wis., 1953; and Interim Specifications for Ties, Timbers, or Construction Material (unpublished), U. S. Forest Serv., Wash., D.C., 1948. Softwoods--Official Grading Rules for Northern Hardwood and Softwood Logs, Northern Hemlock and Hardwood Mfrs. Assoc., 12 pp., Oshkosh, Wis., 1943 (softwood log grades of Prime, No. 1, and No. 2 correspond to log grades No. 1, No. 2 and No. 3 above respectively).

The way log grades affect yields of high-quality (and high-value) lumber can best be shown by example. For red oak the proportion of No. 1 common or better lumber that can be sawn from a grade 1 log is about 70 percent, from a grade 2 log about 44 percent, and from a grade 3 log about 21 percent.

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(Over)

A grade 2 red oak log is worth roughly three-fourths as much as a grade 1 red oak log with the same dimensions; a grade 3 log is worth about half as much as a grade 1 log.^{1/}

The proportion of merchantable volume in the two top grades provides a means of comparing timber quality of several species by survey districts (table 2). Quality of the pines is best in the north. Quality of the hardwood species varies but for most of the species shown is best in northeastern Wisconsin.

The effect of tree size on log grade is illustrated by sugar maple. Over two-thirds of the sawtimber volume of this species in Wisconsin is in trees 16 inches and larger at breast height (table 3). Ninety-six percent of grade 1 logs and 70 percent of grade 2 logs were in these larger trees. Low grades predominate in the 12- to 14-inch diameter classes; high grades in the larger size trees.

^{1/} Hardwood log grades for standard lumber, U. S. Forest Prod. Lab. Rpt. D-1737, 60 pp., Madison, Wis., 1953.

Table 2.--Proportions of merchantable volume in grades 1 and 2 logs in Wisconsin by major species and survey districts

Species	Percent of merchantable volume in grades 1 and 2 logs				
	Entire	North-	North-	Central	Southern
	state	western	eastern	Wisconsin	Wisconsin
		Wisconsin	Wisconsin		
<u>Conifers</u>					
White pine	69	77	71	52	(1/)
Red pine	46	52	45	39	(1/)
<u>Hardwoods</u>					
Sugar maple	43	18	61	54	25
Basswood	42	26	50	52	35
American elm	54	61	36	75	36
Slippery elm	57	(1/)	67	(1/)	42
Red oak	30	24	58	34	26
White oak	16	-	42	13	17
Ash	42	72	37	30	31

^{1/} Sample too small to be representative.

Table 3.--Distribution of sugar maple sawtimber by log grades in three diameter groups, Wisconsin

(In percent)					
D.b.h.	Log grades				
classes	All	No. 1	No. 2	No. 3	Tie &
(inches)	grades				timber

Distribution within log grade

12-14	28	4	30	35	38
16-18	55	68	46	54	53
20+	17	28	24	11	9
Total	100	100	100	100	100

Distribution within diameter group

12-14	100	3	23	46	28
16-18	100	27	18	35	20
20+	100	36	29	24	11
All trees	100	22	21	36	21